

Appl. No.: 10/561,883

Amdt. Dated: December 2, 2009

Reply to Office Action of September 2, 2009

REMARKS

Claims 25-40 stand rejected. Claims 1-24 were previously cancelled. The specification has been amended to correct informalities. Further, claims 25, 26, 28-30, 38 and 40 have been amended herein. Therefore, claims 25-40 are pending and at issue. Applicants respectfully request reconsideration of the rejections of the claims and allowance of the case.

Applicants have amended the specification to include appropriate headings as suggested by the Office Action.

The drawings stand objected to allegedly failing to show every feature specified in the claims. While Applicants disagree with this characterization, the claims have been amended to removed the alleged features in order to further prosecution of the present application.

Therefore, this objection should be withdrawn.

Claims 25, 26, 38, 40 and 48 are objected to for a variety informalities, including that it is allegedly not clear whether the "adhesive layer" and the "first adhesive layer" are the same layer. Careful reading of the claims would reveal that the terms used are in fact "adhesive layer" and "first adhesive" and that the adhesive layer is adhered to the carrier base by the first adhesive, thereby defining different features. However, Applicants have amended the claims to recited a second adhesive and a first adhesive to clarify the claim language. This structure is clearly described on page 6, lines 27-28 such that one skilled in the art would readily understand the recited features.

The claims also stand objected to regarding the phrase "more than at most..." The claims have been amended to recite "machining through the wafer substrate, the first adhesive and the adhesive layer and at most to scribe the carrier base." (claim 40 has been amended similarly). In

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one form, this refers to if the carrier base is machined at all, then it is only scribed, such as described at page 6 lines 7-10 and Figure 2.

Claim 28 stands objected for allegedly being unclear as to whether curing the structure to release the attached singulated adhesive layer from the carrier base is performed with UV or whether curing the attached singulated adhesive layer to adhere the die to the die pad is performed with UV. Claim 28 has been amended to clarify these features. Further, it is clear from the description that adhering the die to the pad is by heating the second adhesive (page 1 line 8; page 7 lines 1-2) and releasing the die from the carrier base is by curing the first adhesive with UV (page 6 lines 27-29). Therefore, these objections should be withdrawn.

Claims 25-30, 33, 37, 39, 40, 41-44 and 47 stand rejected under 35 U.S.C. 103(a) as allegedly being obvious over a combination of Komiyama et al and Izumi et al. Applicants respectfully request reconsideration of this rejection and allowance of the claims.

Komiyama et al is directed to a well-known DAF (Komiyama et al abstract, col. 1 lines 11-15, col. 2 lines 16-29) as acknowledged in the discussion of the Background Art in the present application (page 1 lines 4-13), in which a single adhesive layer is cured by radiation to release a chip together with an adhesive layer from a dicing tape and cured by heating to make the adhesive sufficiently tacky again to adhere the dice to a lead frame. As acknowledged by the Examiner, there is no suggestion in Komiyama et al of laser dicing a DAF wafer. More significantly, there is no suggestion in Komiyama et al of a first adhesive cured by UV for releasing the die from the carrier base with a second adhesive affixed to the singulated die and curing the second adhesive by heat to adhere the singulated die to a die pad (page 6 lines 13 to page 7 line 2) as described in the present invention..

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Regarding Izumi et al, insofar as the machine translation can be understood, is directed to only a dicing sheet that can be cut by laser dicing. In particular, Izumi et al appears to teach a dicing tape comprising a base which "cannot" be cut by laser machining, an intermediate layer which can be laser machined and a laser-machinable adhesive layer (Izumi et al paragraph [004]). Although it is suggested that the base and intermediate layer may also be joined by an adhesive, insofar as we can understand the machine translation we have found no disclosure of a first adhesive layer cured by UV for releasing the die from the carrier base with a second adhesive affixed to the singulated die and curing the second adhesive by heat to adhere the singulated die to a die pad (page 6 lines 13 to page 7 line 2) as described in the present invention.

Applicants therefore submit that there is no suggestion in a combination of Komiyama et al and Izumi et al of the two adhesive structure of the present invention in which a first adhesive is cured by UV to release the die and second adhesive together and the second adhesive is cured by heating to affix the die to a die pad or another die. Therefore, claim 25, as amended to clarify the existence of the two adhesives, and all the claims dependent thereon, are novel and inventive with respect to the cited art. For similar reasons, Applicants submit that independent apparatus claim 40, and the claims dependent thereon, are novel and inventive with respect to the cited art.

Claims 31, 32, 45 and 46 stand rejected under 35 U.S.C. 103(a) as allegedly being obvious over a combination of Komiyama et al, Izumi et al and Mignardi et al. This rejection should be withdrawn as the proposed combination fails to disclose or suggest one or more features recited in the claims.

Mignardi et al is directed to providing a protective coating on a partially fabricated wafer, scribing the wafer, removing the protective coating, completing fabrication of the wafer, and dicing the wafer along the scribe lines (Mignardi et al abstract). In particular, the completion of

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the fabrication step comprises removal of a sacrificial layer in the manufacture of micro-mechanical devices (Mignardi et al col. 1 lines 47-62 more particularly for producing mirror elements (Mignardi et al col. 2 lines 20-25). There appears to be no suggestion of the two adhesives recited in the present claims.

Claims 34-36 stand rejected under 35 U.S.C. 103(a) as allegedly being obvious over a combination of Komiyama et al; Izumi et al and Morris et al. This rejection should also be withdrawn as the combination fails to disclose or suggest one or more features recited in the claims.

Morris et al is directed to a laser cutting (abstract) particularly for semiconductor dicing (col. 1 lines 8-11). In particular Morris et al teaches a UV laser with an elliptical beam (col. 3 lines 1-3). There appears to be no suggestion of the two adhesives as recited in the present claims.

Claims 38 and 48 stand rejected under 35 U.S.C. 103(a) as allegedly being obvious over a combination of Komiyama et al, Morris et al and Yamanaka. This rejection should also be withdrawn as the combination fails to disclose or suggest one or more features recited in the claims.

Yamanaka is directed to dicing of semiconductor wafers including marking defective die with ink marks, affixing an adhesive tape to the upper surface of the wafer, the tape having an adhesive with a thickness at least as great as that of the ink marks and backgrinding before dicing (Yamanaka abstract) so that the tape absorbs the irregularity caused by the ink marks to prevent the wafer cracking during backgrinding (Yamanaka col. 1 lines 45-57; col. 2 lines 50-64). The adhesive may be a UV curable, thermal foam peeling or surface active agent-containing type

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(Yamanaka col. 2 lines 47-49). There is no disclosure or suggestion of the two adhesives recited in the present claims.

Reconsideration of the rejections, in light of the aforesaid amendments and present remarks, is respectfully requested. The present amendments have been entered for the purpose of placing the application into a proper condition for allowance.


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CONCLUSION

Should any informal matters remain which can be corrected by Examiner's amendment, Applicant requests that the undersigned be contacted by phone in order to expedite the prosecution of the present case.

If any fees are due in connection with this application, the Patent Office is authorized to deduct the fees from Deposit Account No. 19-1351 as required. If such withdrawal is made, please indicate the attorney docket number (37389-405200) on the account statement.

Respectfully submitted,

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